San Leandro Computer Club
We're Lovable
JOURNAL
May, 1992

Nominations for Club Officers will be taken at the May General Meeting!
[Election at June's General Meeting]

Ooohh! How Exciting!

"I got mine!"

Pacific Telesis Chairman Sam Ginn did not issue the following statement explaining past employee layoffs and proposed basic rate increases of 60% during the next three years.

"Since 1988 my personal income has risen from $859,000 to more than $2 million a year. This increase was necessary to attract top management talent like myself and is comparable to salaries for similar executives.

"For example salaries more than doubled during the past three years for the top 15 executives of Pacific Bell, who now earn at least $400,000.

"And my retirement package of $522,000 per year is not out of line with at least a dozen Pacific Bell employees who will each probably receive over $200,000 a year in retirement pay.

"Insofar as possible we have covered the expense of these salary increases by reducing service and laying off lower level employees. We believe that approval of our proposed 60% increase in basic phone rates coupled with the reductions in staff and service will allow us ample profit to pump up our stock price enough to justify my salary package to even the most critical stockholder."

"I got mine!"

The University of California Board of Regents showed that they can take the heat by actually holding a public hearing, listening to a raft of criticism and then confirming their earlier backroom deal to pay U.C. president David P. Gardner a lump sum of $737,000 plus $130,000 a year upon his retirement in October. Gardner would have been eligible for the $737,000 after a five year vesting period in any case, so the regents probably figured why quibble over a few months.

Only regents Yvonne Braithwaite Burke and Jeremiah Hallisey voted against the deal. Bet they don't get appointed to much in the future. Especially Hallisey who originally broke the regents code of silence and blabbed about the backroom deal on April 1. (Another April Fool's joke?)

A U.C. spokesman said that cushy salary deals like this are necessary to attract men of Gardner's caliber. Otherwise they are liable to go to work for Pacific Telesis or some other public utility and then U.C. would be stuck with people who are working there only because of their interest in education.

Examples of the quality of Gardner's contribution to the university system include the extensive planning he and his advisors did on how to avoid any negative publicity surrounding his retirement package before the regents approved it; his vigorous lobbying of the state Legislature for more funds for the U.C. system which he said was running out of money; raising student fees by 85% in the last three years; freezing faculty and staff wages and cutting 1,700 jobs and working out a plan four years ago that will give U.C.'s top 22 executives more than $1.5 million in raises over the next three years.

In related news twenty-two colleges and universities accused by the federal government of conspiring to fix tuition and financial aid awards have agreed not to do it anymore.

MIT refused to sign the agreement and is being sued by the U.S. Justice Department.

And of course Stanford is accused of padding its books with phoney expenses on government funded projects.

Are you kids learning anything from all this?

Computer things are always late. Therefore, the Northern California Atari Expo has been postponed from June 25, 26 to December 5, 6.

Congratulations Ron Dellums

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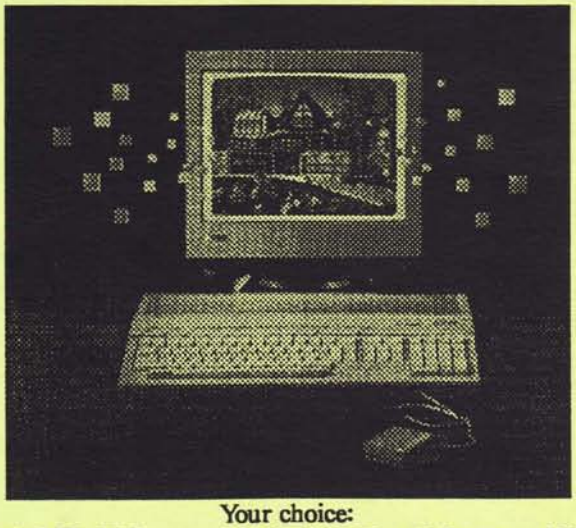

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Jim Hood

Associate Editor
Ray Thomas

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P.O. Box 1506
San Leandro, CA 94577-0374

Do you know how many months "San Leandro" was spelled wrong in the above address?

An independent, non-profit organization of Atari microcomputer users. Membership provides access to the club print and magnetic libraries, subscription to the **Journal** and participation in club activities. A membership application may appear elsewhere in this issue .

Club Officers:

President	Bob Woolley	865-1672
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16-Bit	???	

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Special Interest Groups:

Beginners ST	Jim Moran	865-6122
Beginners 8-Bit	Glen Fowler	530-7128
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May • 1992

FEATURES

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CALENDAR

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	Main Meeting 8:00 p.m. San Leandro Library 5	6	7	8	9
10	ST Meeting 8:00 p.m. San Leandro Library 11	12	13	14	15	16
17	18	19	ST Beginners' SIG 7:30 p.m. 20	21	Journal Deadline 22	23
24	25	26	27	28	29	30
31						

A Fool's April Minutes

Meeting convened at 8:00 PM sharp by President Bob Woolley. Officers Fowler and Moran were present. Officer Jim Hood was elsewhere goofing off as usual. He probably knew that the advertised raffle of a hand scanner would not take place.

President Woolley pointed out the excellent prices on MEGA STE's at San Jose Computer.

There was an announcement from the San Leandro Library requesting assistance in showing people how to use the new computerized library system they have recently installed. No experience is needed as the library staff will show you how the system operates. It is all menu driven. If you can help contact Nancy Fong at 577-3490.

Some of Jim Hood's fancy color art work was passed around as an example of what you can do when you are goofing off.

During the Question And Answer period much time was spent on the need for an ST disk of the month. It was decided that until something better turns up we will subscribe to the Atari Interface Magazine disk of the month for our disks.

A demonstration of "EL CAL", a commercial math program, was made by a mysterious masked stranger (that means I can't remember his name). The program has the ability to make graphs and our stranger highly recommends this program that sells for about $50.

Our regular 8 Bit floppy demonstrator, Bob Scholar, was back on the job this month and did his usual good job presenting the floppy. (A big improvement over his low brow substitute that we had to put up with last month.)

Bob also spoke on the new Daisy Dot III User Guide. The guide does a good job covering the program, and all it's many functions. If you would like additional information give Bob a call at 232-5330.

Don Safer, our resident game cheat and unofficial STE SIG leader, demonstrated a Satellite Tracking program from one of the AIM 16 Bit disks of the month. The program seems to be quite accurate and informative as to the whereabouts of any of the many satellites that are in orbit around our planet.

After a short break and the usual crooked raffle the meeting was adjourned at 9:55 PM.

Jim Moran - Secretary

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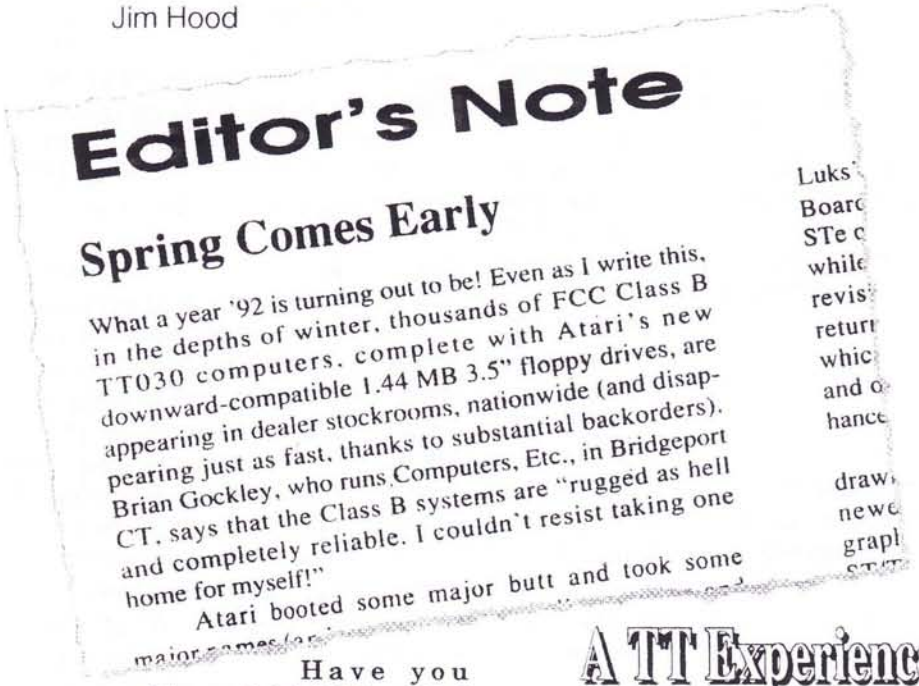

Editor's Note

Spring Comes Early

What a year '92 is turning out to be! Even as I write this, in the depths of winter, thousands of FCC Class B TT030 computers, complete with Atari's new downward-compatible 1.44 MB 3.5" floppy drives, are appearing in dealer stockrooms, nationwide (and disappearing just as fast, thanks to substantial backorders). Brian Gockley, who runs Computers, Etc., in Bridgeport CT, says that the Class B systems are "rugged as hell and completely reliable. I couldn't resist taking one home for myself!"

Atari booted some major butt and took some

Have you seen a Class B TT030 yet? I haven't. Do you know of any area dealers that have received Class B TT030's yet? I don't.

Was the above paragraph, written by John Jainschigg, an April Fool editoral? It was in the March/April *Atari Explorer* after all.

If Brian Gockley really did get some Class B certified TT030's in his Bridgeport, CT store, he should have taken more than one of them home. They could become collector's items. Especially since the word from Atari now seems to be that Atari is not planning to produce Class B TT's.

Hey, in my day I've seen a 1450XLD or two and my son once owned an 815 disk drive, so far be it from me to doubt John's word. But "thousands"? "Nationwide"?

Well, Class A or Class B, Don Garr, of the Atari Exchange of Louisville, bought a TT and wrote about it in their *AELien Transmissions* newsletter of April/May 1992.

We copied it for you ⋯➤

A TT Experience

(TT doesn't stand for Too Terrific)

by Don Garr

As most of you know, I sold my Mega 2 ST system in October 1991. I immediately called Far Out Music, the same day, and ordered an Atari TT030. Rob Brown told me that the TT could take some time to get, so Rob and Far Out very generously loaned me their terrific little Stacy 4 computer. This was an absolutely wonderful experience. For six months, I enjoyed the heck out of that little system. It's just about the perfect computer for anything you need to do with an ST. Just think about it... you've got a 4 megabyte ST system, high resolution display, 40 megabyte *fasssssst* hard disk drive, a very nice feeling keyboard, and a built-in trackball all in one carry-around briefcase sized package. Taking a computer to the AEL meetings was never, NEVER so easy. I don't look forward to hauling around all of those separate pieces of equipment in order to have a working system at the main meeting and ASTRO SIG.

If you get a chance, check out the Stacy at Far Out. I finally and reluctantly released the tight grip I had on that little wonder, so Far Out has it back in stock. Tell Rob you read it here.

My story started back around mid October, as I stated above. Rick Ward told me of a person he worked with who was interested in buying a computer, but wanted something more than a PC clone. My Mega ST was perfect. It was a state-of-the-art 4 megabyte computer with a 79 megabyte hard drive. The system had a PC Speed hardware emulator which ran at about the same speed as a 12mhz 8088. The hard drive had a formatted PC partition which would allow the PC to boot directly from the hard drive. The system also had a Magic Sac, Apple Macintosh emulator. The monitor was high resolution and did an excellent job in any of the three operating systems.

She bought my system site unseen. I didn't really expect that, but then I didn't argue either. Before I even had the check in my hand, I called Rob at Far Out and ordered a 2 megabyte TT030 without a hard drive. I had an eighty megabyte 3.5" SCSI hard drive, which is one of the models marketed with the TT. Knowing a bit about computers and having done many hard drive installations in other computers and ST's, I thought this wouldn't be a problem. This was a big mistake, but I'll eventually get around to explaining that. I also ordered 4 megabyte of TT fast RAM. After all, how much more performance could you get out of a new, faster computer if you used the old slower ST memory. In burst mode, memory fetches should be more than quadrupled.

In late November, I attended the Chicago Atari Fest. When I saw all of those 26 megabyte TT's, my mouth began to lather up. It nearly brought tears to my eyes. A few of the vendors had to run me off to keep me from drooling on their keyboards. It was pretty embarrassing. I also attended a lecture given by Bob Brodie, where he informed us that Atari had recently received the last shipment of "Class A" TT computers. The "Class A" computers were only certified by the FCC for business use. They were not certified for home/personal use. They were also the last TT computers which would have a 720K floppy disk drive. The next shipment of TT computers would be certified as "Class B", for personal use. They would also have a 1.44 megabyte 3.5" floppy disk drive and would come with TOS 3.06 in ROM. Somehow it occurred to me that I had ordered my TT one shipment too early.

While in Chicago, I found and purchased a very expensive TTM195 19" high resolution monochrome monitor. The monitor cost $1000.00, and that was with a $100.00 discount, due to some pretty shrewd negotiating. So I came home from Chicago with a TT monitor that couldn't be used for anything else. And there is sat...

Sometime in early December, Rob gave me a call and told me the TT was in. I really didn't care too much that it was probably the 720K floppy drive, I just couldn't wait any longer. I bet the wheels on that van barely touched the ground on the way over to Far Out. I picked up the new computer and rushed home as quickly as possible. You ever notice how when you're really excited, you can't help but speed.

The first thing I did, was hook up the TT and monitor just to see what it looked like. The page-white display on the 19" display was breath-taking.

After making sure the computer worked, I took it apart to install my 80 megabyte hard drive and the 4 megabyte of TT memory. The first problem I had, was not knowing where to install the TT memory module. There were three different connectors, all looking identical, where the TT memory board could be installed. Having no earthly idea, and not wanting to damage a $570.00 board, I didn't install it immediately. I called Rob and he asked Atari where the memory was suppose to be installed. A day or two later I had the TT memory installed. The only other task needed, was to install my hard drive.

The first thing I noticed about installing a hard drive was, that it couldn't be done. Atari had the infinite wisdom to manufacture and install a cover that prevented anyone stupid enough to buy a TT without a hard drive, from installing one. Now, working for Digital Equipment, I've serviced everything from mini main frame systems to terminals and massive variations of personal computers. I'm not sure I've ever seen a business oriented computer which couldn't have a hard drive installed. They're all manufactured with the ability to house a hard drive. The TT and Mega ST^{e} are designed to prevent the installation of a hard drive. They have a removable cover on the right hand side which the hard drive mounts to. By loosening one screw underneath, the cover swings up and the hard drive comes with it. If you buy a model without a hard drive, Atari installs a cover that has molded fins which fill the entire hard drive area. In order to install a hard drive you have to spend approximately $100.00 more to buy the cover that has the mount. I don't know the exact dollar amount because Rob treated me really well. Because he didn't know about the difference in the TT's, he let me have the mount kit at cost. I must say, Rob and Far Out were really great through this whole ordeal.

I ordered the hard drive mount kit and while waiting for it to arrive, I discovered that the video was unstable. I didn't use the TT very much, because I'm used to using a hard drive, and some of the software I use is very difficult to operate properly from floppies. Anyway, I did some testing on the video, and found that the computer seemed to be causing the horizontal jitter. When the computer was cold, the video was stable. After only about a minute, it would start jerking left and right.

Rob was very supportive, he told me to bring it back and he would get it replaced. I dropped the TT off at Far Out around December 15th and Rob took it from there. I did include a letter which pleaded for the new "Class B" TT. I couldn't pass up the chance to get the newer model with the 1.44 meg floppy drive. Atari offered their usual expedient service, it took almost two weeks just to get a Return Goods Authorization number.

Rob let me hang on to the Stacy through the entire six month process. I couldn't have asked for any more.

I finally received the replacement TT on March 23rd. Do you know, I think I was more excited the second time than I was the first. I picked up the TT and the hard drive mounting kit that same evening, of course. It was a new

TT with the 1.44 megabyte floppy drive. When I got home, I brought in the TTM195 monitor and hooked everything up, before I did anything else, and tested the video. My heart sank when the video was jumping and rolling vertically, but I realized that I had brought the monitor in from the cold garage and it might need to come up to temperature. After about a half hour, it was perfect. I've never seen any display that I thought looked better.

I installed my hard drive, and after a lot of experimenting I got it working if I boot from a floppy. Apparently, when you buy a kit from Atari to install a hard drive, you're not suppose to need any software to control it. We've still been unsuccessful at getting a hard drive utility disk from Atari. I am currently using some Atari hard drive software that comes with the Mega ST^{e}. I can't format the hard drive or make it auto-bootable, but it does work. Luckily my hard drive was already formatted from when I had it installed on the Mega ST with an ICD host adapter. What I would really like to have is an ICD host adapter and use their utilities. But I called them, and they don't have any hard drive software that works without their host adapter.

Hopefully, I will eventually get the proper drivers and my hard drive will be formatable and auto-bootable. But for now, I'm pretty darned happy. Nothing I've ever done on computer has ever looked so good. When viewing a data base, I can see 160 columns by 59 rows of data. When desktop publishing, I can view an entire 8.5" x 11" page, and read the 11 point fonts. I get a feel for the entire page's layout the whole time I'm working. I'm happier than a mosquito in a nudist colony.

In conclusion, ordering my TT from Far Out was the best move I could have made. They supported me 100%, even though it wasn't the easy thing to do. If I had gotten my TT through some other route, I can just imagine what kind of headaches I would have had with the warranty repair. Rob is cooperative and supportive. If you get a chance, support our local Atari dealer... they're worth it.

I've read articles questioning whether the TT is worth the money and I'm here to say, I've worked with graphic work stations which cost more than $15,000.00 and I'm very happy with my purchase.

I don't think the TT would have too many benefits over an ST unless you utilize the TT's extras... the fast memory and the high resolution 1280 x 1020 monitor. If you slowed it down with slower memory, and ran a lower screen resolution, then all you'd really have, is an overpriced ST.

I like the TT a lot. Now all I need is more memory and a bigger hard drive. The TT can have as much as 128 megabytes of usable memory...

YaHooooooo!!!

Berkeley Microsystems has a software routine, SETBOOT.PRG that, when installed on a floppy, will keep paging the hard disk and resetting the computer during the hard drive's power on initialization period until the hard disk is initialized. This allows both the computer and hard drive to be turned on at the same time. If you're interested call Chris at 510-547-2191.

If you would rather accomplish the same result through a hardware modification, read the following article, reprinted from the April, 1992 Madison Area Atari Users Group Newsletter

ST POWER-ON MODIFICATION

Jeff Rigby,
Intersect Software

The following modification will cause the ST to be in a Halt condition for approximately 14 seconds following turn-on. This allows a hard drive time to go through its initialization. The modification will not affect reset timing (.3 sec). It's relatively simple in that it requires the replacement of only one resistor (in the 520 & 1040 series).

If you have a Hard Drive for your ST you presently have to turn on the HD, wait until it stops making noise (initialization: about 14 sec) and then turn on your computer. With the circuit modification below you can now turn both on at the same time (idiot proof).

All computers have reset circuits and a circuit to perform a reset after the

computer has been turned on (allowing the power supply to stabilize). In the ST these two reset circuits are in one chip, a 556 timer IC (a 556 is two 555 timers in one package). Both circuits use the same timing components for a delay of .3 seconds. One circuit holds the reset low for .3 sec after the reset button has been pushed and the other holds the reset low for .3 seconds after power turn-on. This second circuit (power on reset) is the one we are going to change.

Basically we are looking at a 22µf cap charging from B+ through a resistor (12kΩ). When the voltage on the cap reaches trigger level the 555 timer turns off, allowing the reset line to go high.

The formula for Time T (in seconds) with Capacitor C and resistor R is T=(1.1)*R*C. For a stock ST, R=12kΩ and C=22µf, thus:

T=(1.1)*(12000)*(0.000022)
=.29 sec.

OK now for your computer... Turn on your Hard Drive and count the seconds until the activity light goes out. Mine is about 14 seconds. This time is what you need to determine the value of the resistor you are going to add to your ST. For a time of 14 sec we use the following formula to determine the resistor we need.

R=(14sec)/(1.1)*(0.000022)
=578k.

Look in your ST for a Chip that has the number 556 on it (near the reset button). Off pin 8 you will find a resistor with the color bands: brown red orange (12kΩ). On a 520ST this should be R83; on a 1040ST, R9. Cut this resistor loose and install a 560kΩ resistor; green, blue, yellow.

Now reassemble and check. Extremes of temperature can affect the timing of this RC circuit. I have found that a very cold computer (40 degrees F) can knock almost two seconds off the circuit's reset time. Also, the 22µf cap is manufactured with a tolerance of 20%, which can make a 4 second difference in your calculations. You may want to install a variable resistor in place of a fixed resistor. If you are like me, you can't wait for your computer to come on and you will want the minimum wait time that still allows the HD to initialize properly. The variable resistor will allow you to set the time to the nearest second. Use a 360kΩ resistor in series with a 500kΩ potentiometer.

The above modifications require some technical skill and should be done by a service center or a qualified person. Intersect Software makes no guarantees regarding the reliability of the above modifications. You, as always, perform them at your own risk.

This technical note may be freely copied as long as the credits remain intact: Jeff Rigby, Intersect Software, 3951 Sawyer Rd., Sarasota, FL 34233.

[MAAUG] Editor's note: the modification works, at least in my old 1040. I found the resistor in question right under the power supply, where it was removable from the top without even taking off much of the RF shielding. A 470kΩ replacement resistor was just right.

How nobody envisioned such a simple fix in the ST's previous seven years of existence, I can't guess. This may do the trick for those whose machines can't properly use software-only boot delays like SILKBOOT and SCSIWAIT; maybe even a subtle change, say from .3 to .6 seconds (by doubling the resistor size to 24kΩ) could yield better behavior at powerup.

Where the author suggests a 360kΩ resistor/500kΩ pot, 12k/1M (1 megohm=1000 kilohm) would give you the ability to turn the delay all the way down for a quick floppy boot. There's no reason the potentiometer couldn't be mounted outside the machine, in some reasonably neat way, to allow adjustment without taking the computer apart. The pot should probably have a linear taper, rather than the logarithmic type used for audio volume controls.

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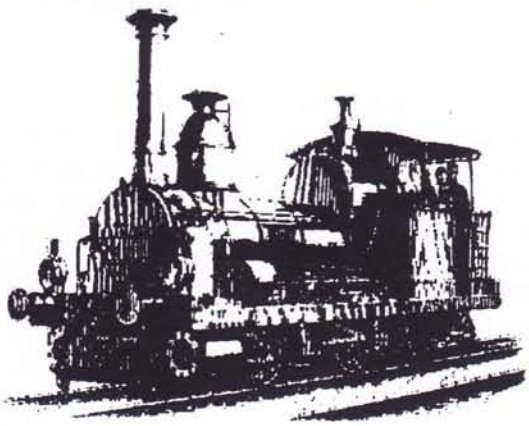

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Pounding on the 8-Bits

Buy your own / Share what you know / 8 bits are plenty

May, 1992

by Bob Woolley

Last month I did a 1 meg upgrade for the 1200XL with the option to increase it to 4 megs of RAM. Considering how long it takes to load even 1 meg, what possible use could anyone have for a 4 meg memory? Even with a 720K disk drive, it takes a long, long time to fill the thing up - all a big drive does is keep down the disk swaps. What is needed is a hard drive connected right to the system buss. Maybe one of those new IDE drives?

I have mounted a 3.5 inch floppy inside the 1200XL, so I thought maybe a 3.5 inch IDE drive would also fit. It did. Doesn't need a hole cut in the case like the floppy, either. Piece of cake. What you need to do is remove the heat sink and regulators from the board along with a few coils and the RF modulator that stick up into your space. ** When you remove the modulator, be sure you jumper the ground path back to the circuitry near the video ** Power is now supplied from an external +5/+12 volt supply with enough capacity to run both the hard drive and the 1200XL (5v/2.5a & 12v/2a). I mounted a six pin DIN plug in the old modulator plug location as a power plug - one that does not match either the XL/XE power or the video connector. The 5 volt line for the main board still goes thru the 1200XL power switch while the drive gets continuous power.

And then you build this rats nest board with maybe 20 ICs on it? And about 12K of code to access the drive?

Naaawwwwww..... I'm talking to my drive thru a single IC and maybe a 200 byte driver. Of course, my drive doesn't quite work yet, but I have read a sector into memory successfully. These IDE drives do just about everything for you. All I send the drive is the sector number, head and cylinder and tell him to read. The drive seeks to the proper location, reads the data into a buffer and then continues to read sectors into his buffer for future reads, much like a Happy. Of course, a hard drive is much, much faster than any Happy. This setup should load up a meg or 4 in no time. There are no problems with interrupts causing overruns, no formatting is required on the drive, and the drives are CHEAP and plentiful. The 1200XL is used as a case for the drive - only a power supply is necessary (I got an IBM style supply that sits on a shelf under my system at a surplus store for $10). This month I will outline how the IDE drives work. Next month, I expect to have the schematics and code finished.

The IDE drive looks like 9 registers to the system, 1 data and 8 control regs. Table 4-2 shows their functions and addresses, which are the IBM system values since these drives were designed specifically for an IBM AT. The interface pins in table 4-1 only show the 3 address lines SA0-2 and the CS0 and CS1 pins. This is all you need to select the registers. I currently select them at $D600-07 and $D706 to keep it simple (1 IC), but the code will go into $D600-D7FF so the addresses will have to be moved into someplace like $D1xx. The drive does an implied seek for you whenever you read or write a sector, so all you need to do is load the sector reg at $xxx3, the cylinder regs at $xxx4 and 5, and a sector count at $xxx2 (usually 1). Then a command is written into $xxx7 and you're off to the races! As long as the status reg at $xxx7 has the DRQ bit set, you can move data from/to the data reg at $xxx0. Once 256 bytes have been transferred, the controller drops the DRQ and BSY line. If an error occurs anywhere along the way, the status reg will set the ERR bit and the command will abort. The only commands you really need are read and write, everything else is automatic - included only because the IBM thinks this is an old MFM drive and controller. The Fixed Disk Control Reg is used to enable interrupts and reset the controller if needed. I have not used interrupts on my drive yet, although it would not be difficult to do so. Maybe some time later.

One thing you may notice - the data buss is 16 bits wide. For now, I am just using half of the buss which throws away half the drive capacity. The best solution is to select either high or low byte as different logical drives, all data for D3: being in the 0-7 data byte and all data for D4: in the 8-15 byte, for example. Otherwise, you would have to deal with 512 byte sectors (256x2) and read each sector twice, once as 0-7 and once as 8-15. I was never happy that our hard drives did not allow enough flexibility to do things like DOS 2.0, 128 byte sectors and such. Keeping to single byte logical drives will make such compatability easier.

Currently, the drive interface does not quite meet the IDE timing specs which causes erratic behavior. I need to add a couple of ICs to do 16 bit transfers and fix the timing, in the meantime, take a look at the IDE regs and commands that we will be using. If you want a more complete source, call Western Digital at 800 + 847-6181 and ask for the technical reference manual for a WD93044-A drive, #WD0058S. They are real nice folks.... don't waste your time calling Conner. Their drives work real good, too! (a 40 meg WD drive is about $200 new)

Table 4-1. J2 Pin Descriptions

PIN	MNEM.	SIGNAL NAME	I/O	FUNCTION
1	RST-	Reset	I	Initializes the Intelligent Storage Peripheral when asserted.
3,5,7,9, 11,13,15, 17	SD7-0	System Data Bus Bits 7-0	I/O	16-bit, tri-state, bi-directional bus for transferring status, data and control information between the Host and the Intelligent Storage Peripheral.
4,6,8,10, 12,14,16, 18	SD8-15	System Data Bus Bits 8-15		
2,19,22, 24,26,30, 40	GND	Ground		
20				Key - Not connected.
21,27,28, 29				Reserved - Not connected.
23	IOW-	I/O Write-	I	The Host or DMA controller asserts IOW- when a data or control byte is written to the Intelligent Storage Peripheral.
25	IOR-	I/O Read-	I	The Host or DMA controller asserts IOR- when a data or status byte is to be read from the Intelligent Storage Peripheral.
31	IRQ14	Interrupt Request 14	O	The Intelligent Storage Peripheral asserts IRQ to request an interrupt service routine from the Host.
32	I/OCS16-	I/O Channel Select 16	O	Identifies data transfers to or from the Host as 16 bits wide.
35,33,36	SA0-2	Address Bus	I/O	A0, A1 and A2 address I/O ports 0 through 7.
34	PDIAG	Passed Diagnostics	I/O	Output from slave drive when it has passed its diagnostics. Input to Master drive.
37	CS0-	Card Selected Registers 0-7	I	The Host asserts CS0- to address and communicate with the Intelligent Storage Peripheral on the I/O channel.
38	CS1-	Card Selected Auxillary Registers	I	The Host asserts CS1- to address and communicate with the Intelligent Storage Peripheral's auxilliary registers.
39	ACTIVE-	ACTIVE-	O	This open collector output may be used to drive an external LED activity indicator.

4.2 HOST INTERFACE - REGISTERS

4.2.1 REGISTER ADDRESS MAP

The Task File occupies the address space shown in Table 4-2. The Task File's eight registers pass command, status, and data information between the host and the intelligent storage peripheral. All registers are eight bits wide, except for the data register which is 16 bits wide. These registers are accessed via control lines SA0-2, CS0-, and CS1-. When the drive is busy, only the status register is accessible with CS0- active. The Alternate register is always accessible with CS1- active. Primary and secondary addresses are provided for dual installations.

Table 4-2. Task File Map

I/O ADDRESS		REGISTERS	
Primary	Secondary	Read	Write
1F0	170	Data Register	Data Register
1F1	171	Error Register	Write Pre-Comp
1F2	172	Sector Count	Sector Count
1F3	173	Sector Number	Sector Number
1F4	174	Cylinder Low	Cylinder Low
1F5	175	Cylinder High	Cylinder High
1F6	176	SDH	SDH
1F7	177	Status Register	Command
3F6	376	Alternate Status	Fixed Disk Control
3F7	377	Digital Input	Undefined

4.2.2 REGISTER DESCRIPTIONS

4.2.2.1 Data Register

This register holds the data to be transferred to or from the host on Read and Write commands. All transfers are high speed and 16 bits wide, except for ECC bytes transferred during Read Long or Write Long commands, which are 8-bits wide.

4.2.2.2 Error Register

This register contains an error code that indicates a particular type of failure on the intelligent storage peripheral. The register contains a valid error code only if the Status Register error bit 0 is set. The only exceptions are power-up and issuance of a diagnostic command. In these cases the error register contents are valid regardless of the condition of the Status Register's error bit. These two exceptions can cause the following error values:

01 = No Error
02 = WD42C22A Task File copy error
03 = Buffer RAM error
04 = WD42C22A Task File error
05 = WD1017 Internal RAM error or ROM checksum error
8X = Slave drive failed

If a Slave is present and has failed its diagnostic, 80H is ORed with the Master's status bits. In all other cases the error register bits are defined as follows when asserted (=1):

Bit Position							
7	6	5	4	3	2	1	0
BBD	ECC	0	IDNF	0	AC	TK0	DAMNF

where:

BBD = Bad Block Detected
ECC = Error Correction Code (uncorrectable error detected)
IDNF = ID Not Found (target sector could not be found)
AC = Aborted Command
TK0 = Track 0 (unable to find a valid track 0)
DAMNF = Data Address Mark Not Found

4.2.2.3 Write Precompensation Register

The intelligent storage peripheral ignores any precompensation value written to the Write Precompensation register. Precompensation values are automatically set by the intelligent storage peripheral.

4.2.2.4 Sector Count Register

This register indicates the number of sectors to be transferred during a Read, Write or Verify operation. (A value of zero indicates a count of 256 sectors.) During a Format operation, this register contains the number of sectors per track. When read by the host, it indicates the number of sectors, if any, that were not read or written during the previous command.

4.2.2.5 Sector Number Register

When written to by the host, this register defines the target sector number for the current operation.

4.2.2.6 Cylinder Low/Cylinder High Registers

These two registers contain the logical cylinder address for commands that require an address. These registers also serve as a 16-bit command register for extended commands. The Cylinder Number Low register contains the eight low order bits of the starting cylinder number. The Cylinder Number High register contains three high order bits of the starting cylinder number.

Bit Positions							
7	6	5	4	3	2	1	0
LSB	LSB	LSB	LSB	LSB	LSB	LSB	LSB
0	0	0	0	0	MSB	MSB	MSB

4.2.2.7 SDH Register

This register selects the drive and head number for a particular operation. The bit assignments are as follows:

Bit Positions							
7	6	5	4	3	2	1	0
1	SS1	SS0	D	HS3	HS2	HS1	HS0

where:

SS1-SS0 = Sector Size = 01
D = Intelligent Storage Peripheral Select Bit
HS3-HS0 = Logical Head Select Bits

When the DS bit is set, the slave drive is selected. When the DS bit is reset, the master drive is selected.

4.2.2.8 Status Register

This register contains the drive's status following a command. These are the bit assignments:

Bit Positions							
7	6	5	4	3	2	1	0
BSY	RDY	WF	SC	DRQ	DWC	IDX	ERR

where:

BSY = Busy, indicates state of controller
RDY = Ready, indicates state of target drive
WF = Write Fault, indicates hazardous condition and aborts command request
SC = Seek Complete
DRQ = Data Request
DWC = Data Was Corrected
IDX = Index, index pulse of target drive
ERR = Unrecoverable error

4.2.2.9 Command Register

The host requests a controller/drive function by writing a function code into this register. The write action sets BSY in the Status Register. See section 4.3 for a description of all the commands supported by the intelligent storage peripheral.

4.2.2.10 Alternate Status Register

This register provides the same information as the Disk Status Register at a different address.

4.2.2.11 Fixed Disk Control Register

This register allows for a programmable controller reset and provides the ability to enable or disable control of the fixed disk priority interrupt.

Bit Positions							
7	6	5	4	3	2	1	0
0	0	0	0	0	RST	IDS	0

The software controlled reset bit (RST) maintains the fixed disk in a reset condition as long as it is active (high). The bit must be turned on (for a minimum of 5.0 microseconds), then off, to complete the reset function.

Table 4-3. Command Opcodes

COMMAND		BINARY OPCODE							
		7	6	5	4	3	2	1	0
Recalibrate	1X	0	0	0	1	X	X	X	X
Seek	7X	0	1	1	1	X	X	X	X
Read	2X	0	0	1	0	0	0	L	R
Write	3X	0	0	1	1	0	0	L	R
Format Track	50	0	1	0	1	0	0	0	0
Read Verify	40	0	1	0	0	0	0	0	R
Execute Diag.	90	1	0	0	1	0	0	0	0
Initialize Drive	91	1	0	0	1	0	0	0	1
Scan ID	92	1	0	0	1	0	0	1	0
Read Buffer	E4	1	1	1	0	0	1	0	0
Write Buffer	E8	1	1	1	0	1	0	0	0
Identify Drive	EC	1	1	1	0	1	1	0	0

L = Long Mode Bit
0 = Normal mode, normal ECC functions
1 = Long mode
R = Retry Bit
0 = Error retries & ECC enabled
1 = Error retries disabled
X = Don't care

4.3.3 Read Sector (20H)

For a Read Sector command the Task File's registers determine the number of sectors to be transferred to the host and their location. The host can request a maximum of 256 sectors. (A sector count of zero specifies 256 sectors.) If the drive is not positioned at the specified cylinder, an implied seek occurs. If the Long Mode bit is set, four ECC bytes are transferred along with the data. Single burst data errors (up to 11 bits) are corrected if retries are enabled and the long mode is not selected. An interrupt occurs after the data read from each sector is transferred to the host. Recognition of a bad block causes termination of the Read Sector command.

If the data cache is enabled, the controller looks ahead and buffers sectors until the data buffer is full. If the next read command requests a sector(s) that have been buffered, the data transfer occurs immediately, thus improving overall system performance. The controller and host protocols for interrupts, busy, data requests and status are the same for both normal and cached data transfers.

REGISTER	REGISTER CONTENTS
Write Precomp	X X X X X X X X
Sector Count	1 - 256 Sectors to Read
Sector Number	Starting Sector Number
Cylinder Low	Starting Cylinder LSB
Cylinder High	Starting Cylinder MSB
SDH	Sector Size, Drive & Head
Command	0 0 1 0 0 0 L R

L = Long Mode Bit
R = Retry Bit

4.3.4 Write Sector (30H)

For a Write Sector command the host transfers a number of sectors (1-256) to the drive, starting at the logical address specified by the Task File registers. An implied seek occurs if the drive is not positioned at the specified address. If the Long Mode bit is set, then the host will transfer four ECC bytes along with the data.

An interrupt is generated as the data for each sector is required (except the first). The first data buffer contents are sent after the host has issued the command and the data request status bit is "on". Recognition of a bad block ID field terminates the command.

REGISTER	REGISTER CONTENTS
Write Precomp	X X X X X X X X
Sector Count	1 - 256 Sectors to be Written
Sector Number	Starting Sector Number
Cylinder Low	Cylinder Address LSB
Cylinder High	Cylinder Address MSB
SDH	Sector Size, Drive & Head
Command	0 0 1 1 0 0 L R

L = Long Mode Bit
R = Retry Bit

OUR 8-BIT DISKS

by Bob Scholar SLCC 8-bit Software Chairman

SLCC DISK- April 1992

Some Editorial Comments:

Being an 8-bitter can be discouraging or exciting. Recently, it's beginning to look a bit more on the up side! (1) You know that Ben Poehland and Jeff McWilliams are trying to get a new magazine started. (2) The Feb. 1992 AIM magazine (p.42) reviewed an excellent, low priced, user's guide for DD3. (3) The April issue (on p.48) reviewed a two disk catalog system by Ron Fetzer and Stan Schenfeld of O'HAUG.

While this isn't really a storm of activity; when you consider some of the other recent P.D. advances (Turbo Basic, MYDOS, TextPro) it's quite obvious that a lot of talented people are still interested and actively developing the 8-bits. It's up to all of us to encourage these activities.

I got the DD3 User's Guide, and made a brief report on it at our April meeting. It's an amazing piece of work;- and I may write a column or two about it, for the Journal. It gave me some 'hands on' ideas, which I am using for this column (some may not be obvious). I also sent for the O'HAUG disk catalog system, and I'll report my reactions later.

BACK TO OUR D.O.M!

This month's features start with the updated FULMenu for MYDOS (with MYDOS, of course). Also on the front is a new multi-format PIC viewer called PANTHEON, for any 8-bit Atari, by Clay Halliwell;- with 5 pictures in 4 formats. There is also an excellent DOC; not in 40 column format, but easily readable. Also on the front is CARDTRIX.BAS; a data base program with a good DOC;- in word processor format.

The back has four games, 3 from AIM magazine and 1 (PIPELINE.ARB) from PAGE 6. All have DOCs. Pipeline is in Turbo Basic (for XL/XE only). It will RUN automatically when you boot the back. Use the Menu from the front for the others.

CONTENTS

Games (with DOCs or instructions)
- PIPELINE.ARB- Like Rollerball.
- MONTANA.COM- a tough solitaire.
- MYJONG.EXE- based on Mah-Jong.
- KR.BAS- 4 simple BASIC games.

PICtures
- PANTHEON- (BASIC) and DOC; plus;-
  - 5 PICtures in assorted formats.

UTILity (with DOC)
- CARDTRIX.BAS- db with unique features.

PROGRAM COMMENTS

PIPELINE.ARB by Chris Guise (from PAGE 6 magazine) is in Turbo Basic;- for XL/XE only. It's for one player with J/S. It runs automatically when you boot the back, because I've added DOS and T.B. (the N. American version;- as AUTORUN.SYS). There are two auxiliary files. I added a short DOC to supplement its instructions. It may remind you of ROLLERBALL (SLCC Vol.7;#6). It has 10 levels- you can play any one. You can study and plan each one before you play it. A fine game- but tough in the higher levels.

MONTANA.COM by Steve Budrys, is another solitaire- from AIM (2/1992). It has instructions and a very short DOC. It looks impossible, but I worked it out.

MYJONG.EXE by Bruce Fish, is also from AIM (2/1992). It has an excellent DOC (in 80 col. format). It resembles GEMINI (SLCC Vol.9; #5) with lots of options!

KR.BAS (KNIGHT RIDER) by J. R. Payne, is from AIM 3/1992). It's really 4 games in one- for 1 or 2 players. Instructions are integral in the program.

PANTHEON by Clay Halliwell (of Lonersoft) is Shareware (3/1992). It includes an (optional) loader, a data file, and an excellent DOC (in Word Processor format). It's for any Atari 8-bit, and will display PICtures in most formats. Five PICs, in four different formats are included. I had a GR9 PIC, but there wasn't enough space on the disk to include it!

CARDTRIX.BAS is from AIM, Feb. 1992. It's a small dB UTILity (XL/XE only) which can print on 3"x5" cards; or SAVE to disk; or store on a hard disk. It has a very good DOC- in W.P. format. Originally in TI 99/4A format; it was written by Randy Thompson; and translated by Charles A. Cole.

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May General Meeting:

Once again we have a rumor that a Migraph hand scanner will be raffled off at the General Meeting. Is this rumor any more believable than last month's?

It is if Bob Brodie can attend the meeting and remembers to bring a scanner from Atari to donate to the raffle. Otherwise expect a keyboard cover or mouse pad.

A guest speaker?? Yet another rumor has it that our ever diligent Program Chairman, Keith Sammons, has arranged to have a speaker come from PLI.

PLI is the Fremont based hard drive, removable cartridge drive, optical drive manufacturer that recently signed an agreement to supply equipment for Atari's TT and future SCSI-compatible computers.

Their line includes hard drives to 2.1 Gigabytes, magneto-optical drives to 600 Megabytes, 2 GB DAT-based tape backups, 88 MB Winchester/Syquest removable-media subsystems and CD/ROM players.

And names will be taken for June's election of club officers. Run for office. Why should Woolley, Hood, Moran and Fowler get first crack at all the club's boodle?

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